

**Amendment to the Claims:**

1. (Currently Amended) In a wireless communication system with a network overlay geo-location system, wherein the wireless system includes plural base stations and a Mobile Switching Center (MSC), each of said plural base stations including one or more pre-assigned sectors defining a coverage area of the respective base station and wherein one or more of the plural base stations include a smart antenna, a method for determining a location of a target mobile appliance comprising the steps of:

determining a serving sector from the pre-assigned sectors in the MSC;

determining from a database whether the serving sector's base station has a smart antenna;

scanning antennas elements of the serving sector's base station, prior to pattern forming, for the target mobile appliance's signal to determine the actual sector serving the mobile appliance; and,

tasking sensors in proximity of actual sector to locate the mobile appliance.

2. (Original) The method of claim 1, wherein the database comprises a field indicating if the serving sector is associated with a base station having a smart antenna.

3. (Original) The method of claim 1, wherein the target mobile appliance's signal is a reverse pilot signal.

4. (Original) The method of claim 1, wherein the step of scanning antenna elements comprises measuring a parameter of the mobile appliance's signal for the antenna elements.

5. (Original) The method of claim 4, wherein the parameter is selected from the group of received signal strength and a cross correlated quality metric.
6. (Original) The method of claim 1, wherein the actual sector is the same as the serving sector.
7. (Original) The method of claim 1, wherein the actual sector is not the same as the serving sector.
8. (Original) The method of claim 1, wherein the sensors proximate to the actual sector locate the mobile appliance using time-difference-of-arrival
9. (Original) The method of claim 8, wherein the sensors proximate to the actual sector locate the mobile appliance using angle-of-arrival.
10. (Original) The method of claim 1, further comprising the steps of scanning antenna elements of base stations neighboring the serving sector's base station to determine the actual sector in which the mobile appliance is located.
11. (Original) In a network overlay geo-location system for wireless appliances operating in a host wireless communication system, wherein the host system includes a plurality of base stations including plural sectors defining a coverage area, wherein at least one base station employs a smart antenna, and a mobile switching center and a mobile positioning center, wherein the geo-location system uses information parameters from the mobile positioning center to assist in the location of wireless appliance, a method of determining the location of a target wireless appliance comprising the steps of:

receiving a serving sector in the information parameters from the mobile positioning center;

tasking sensors in proximity of each sector in the base station containing the serving sector to locate the mobile appliance, thereby determining the location of the target wireless appliance.

12. (Currently Amended) The method of claim 11, wherein the information parameters include Radio Frequency(RF) channel.

13. (Original) The method of claim 11, wherein the sensors in proximity to each sector locate the mobile appliance using time-difference-of-arrival.

14. (Original) The method of claim 13, wherein the sensors in proximity to each sector locate the mobile appliance using angle-of-arrival.

15. (Currently Amended) In a wireless communication system with a network overlay geo-location system, wherein the wireless system includes plural base stations, [[an]] a Mobile Switching Center (MSC), and [[an]] a Mobile Positioning Center (MPC), wherein each of the plural base stations have one or more assigned channels for each sector representing a coverage area, and wherein one or more of the plural base stations include smart antennas for adapting the sectors within the coverage area including reassignment of channels, a method of determining the location of a mobile appliance independently of sector information provided by the MPC comprising the step of tasking all geo-location sensors in the geo-location system to search for the signal and selecting a set of sensors based on the mobile appliance's signal parameters at each sensor and locating the mobile appliance with the set of sensors.

16. (Original) The method of claim 15, wherein the mobile appliance's signal is a reverse pilot signal.

17. (Original) The method of claim 15, wherein the parameter is selected from the group of received signal strength and a cross correlated quality metric.

18. (Original) The method of claim 15, wherein the set of sensors locate the mobile appliance using time-difference-of-arrival.

19. (Original) The method of claim 15, wherein the set of sensors locate the mobile appliance using angle-of-arrival.

20. (Original) The method of claim 15, wherein the mobile appliances signal is a traffic signal.

21. (Original) A method of locating a mobile appliance operating in a wireless communication system with at least one base station employing a smart antenna, including the steps of receiving mobile information from the wireless communication system, said mobile information including information for determining a serving sector, and tasking geo-location sensors proximate to a search area to locate the mobile appliance, the improvement comprising the steps of:

for each antenna output associated with the serving sector's base station, measuring a parameter of the mobile appliance's signal; and,

selecting the search area based on the measured parameters, thereby improving the locating of the mobile appliance.

22. (Original) The method of claim 21, wherein the mobile appliance's signal is a reverse pilot signal.

23. (Original) The method of claim 21, wherein the parameter is selected from the group of received signal strength and a cross correlated quality metric.

24. (Original) The method of claim 21, wherein the sensors proximate to the search area locate the mobile appliance using time-difference-of-arrival.

25. (Original) The method of claim 21, wherein the sensors proximate to the search area locate the mobile appliance using angle-of-arrival.

26. (Original) The method of claim 21, wherein the mobile appliance's signal is a traffic signal.

27. (Original) In a network overlay location geo-location system for wireless appliances operating in a host wireless communication network, wherein the host network includes a plurality of base stations, wherein at least one base station employs a smart antenna, wherein the geo-location system uses wireless communication network information to assist in the location acquisition of wireless appliance, a method of determining the location of a target wireless appliance from the target wireless appliance's signal parameters measured at plural geo-location sensors comprising the steps of:

determining from a database which geo-location sensors are located at base stations with smart antennas;

adjusting the measured parameters from geo-location sensors located at base stations with smart antenna; and,

determining the location of the mobile appliance from the adjusted measured parameter.

28. (Original) The method of claim 27, wherein the target wireless appliance's signal is a reverse pilot signal.

29. (Original) The method of claim 27, wherein the parameter is time-of-arrival.

30. (Original) The method of claim 27, wherein the geo-location sensors locate the target wireless appliance using time-difference-of-arrival.

31. (Original) The method of claim 27, wherein the geo-location sensors locate the target wireless appliance using angle-of-arrival.

32. (Original) The method of claim 27, wherein the target wireless appliance's signal is a traffic signal.

33. (Original) The method of claim 27, wherein the adjustments to the measured parameters are time delay based.

34. (Original) A wireless communication system comprising:

plural base stations for communicating with one or more mobile units, wherein at least one of the plural base stations comprises a smart antenna; the smart antenna comprising an antenna array and a pattern-forming network;

a network overlay geo-location system comprising a plurality of sensors located at the plural base stations;

a mobile positioning center; wherein the mobile positioning center is in communicational connection with wireless network and the network overlay geo-location system;

wherein at least one of the plurality of sensors is interfaced between the antenna array and the pattern-forming network.

35. (Original) The system of claim 34, wherein the smart antenna further comprises a fixed beam former and the at least one plurality of sensors is connected at an interface between the antenna array and the fixed beam former.

36. (Original) The system of claim 34, wherein the smart antenna further comprises a fixed beam former and the at least one plurality of sensors is connected after the beam-forming network at an interface.

37. (Original) A network overlay geo-location system in a wireless communication system with a host base station having a smart antenna, wherein said smart antenna includes an antenna array and a pattern-forming network, the improvement comprising geo-location sensors connected between the antenna array and the pattern forming network.

38. (Currently Amended) In a wireless communication system with a network overlay geo-location system for locating a mobile appliance, wherein the wireless communication system includes plural base stations, and a Mobile Switching Center (MSC), a method for

locating the mobile appliance comprising the steps of: retrieving serving sector information from wireless communication system, determining from a database if the serving sector is at a base station with a smart antenna and switching the network overlay geo-location system to a selected one of two different operating modes based on the determination.

39. (Original) The method of claim 38, wherein one of the two different operating modes comprises the steps of:

measuring the mobile appliance's signal's parameters at plural geo-locations sensors;

adjusting the measured parameters from geo-location sensors; and

determining the location of the mobile appliance from the adjusted measured parameters.

40. (Original) The method of claim 39, wherein the geo-location sensors locate the mobile appliance using time-difference-of-arrival.

41. (Original) The method of claim 39, wherein the geo-location sensors locate the mobile appliance using angle-of-arrival.

42. (Original) The method of claim 39, wherein the mobile appliance's signal is a traffic signal.

43. (Original) The method of claim 38, wherein one of the two different operating modes comprises the steps of:

for each antenna output associated with the serving sector's base station, measuring a parameter of the mobile appliance's signal;



selecting a geographic search area based on the measured parameters; and,

tasking a set of geo-location sensors proximate to the search area to locate the mobile appliance.

44. (Original) The method of claim 43, wherein the mobile appliance's signal is a reverse pilot signal.

45. (Original) The method of claim 43, wherein the parameter is selected from the group of received signal strength and a cross correlated quality metric.

46. (Original) The method of claim 43, wherein the set of sensors locate the mobile appliance using time-difference-of-arrival.

47. (Original) The method of claim 43, wherein the set of sensors locate the mobile appliance using angle-of-arrival.

48. (Original) The method of claim 43, wherein the mobile appliance's signal is a traffic signal.

49. (Currently Amended) The method of claim 38, wherein the wireless communication system includes a Mobile Positioning Center (MPC) and the serving sector information is retrieved from the MPC.

50. (Currently Amended) The method of claim 27, wherein the wireless communication network includes a Mobile Positioning Center (MPC) and the wireless communication network information is provided by the MPC.

51. (Currently Amended) The method of claim 21, wherein the wireless communication system includes a Mobile Positioning Center (MPC) and the mobile information is provided by the MPC.